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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 20277 | 7590 | 07/19/2005 | EXAMINER | |
| MCDERMOTT WILL & EMERY LLP | | | TRAN, MAI HUONG C | |
| 600 13TH STREET, N.W. | | | ART UNIT | |
| WASHINGTON, DC 20005-3096 | | | PAPER NUMBER | |
| | | | 2818 | |

DATE MAILED: 07/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/747,680

Applicant(s)

ZHONG ET AL.

Examiner

Mai-Huong Tran

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/6/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restriction

Application's election without traverse of Group II (Claims 1-12) drawn to process of making a semiconductor device is acknowledged for prosecution in the subject application. Accordingly, claim 13 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Applicants have the right to file a divisional application covering the subject matter of the non-elected claims.

Specification

The specification is objected to for the following reasons.

The specification does not include reference sign 50 of Figure 7 (see CFR § 1.84p). Correction is required.

Claim Rejections - 35 U.S.C. § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2 and 4-9 are rejected under 35 U. S. C. § 102 (b) as being anticipated by U.S. Patent No. 6,323,519 to Gardner et al.

Regarding to claim 1, Gardner discloses a method of forming a spacer, comprising the steps: depositing a spacer layer 54 over a substrate 12 and a gate electrode 18 having a top surface and vertically extending sidewalls; forming a protective layer 52 on the spacer layer 54; etching the protective layer 52 to remove the protective layer from the spacer layer 54 over the top surface of the gate electrode 18 and maintain the protective layer 52 on the spacer layer 54 parallel to the sidewalls of the gate electrode 18; etching the spacer layer 54 to remove the spacer layer 24 from the substrate 12 and over the top surface of the gate electrode 18 to form spacers on the gate electrode with each spacer having two substantially vertical sidewalls extending parallel to the gate electrode 18 sidewalls (cols. 6-11, and figs. 14-18).

Regarding to claim 2, the method of claim 1, wherein the spacer layer is deposited to a thickness greater than 200 .ANG. (col. 9, line 67, col. 10, lines 1-3).

Regarding to claim 4, the method of claim 3, wherein the spacer layer 54 is a nitride and the protective layer 52 is an oxide (col. 11, lines 4-8).

Regarding to claim 5, Gardner discloses a method of forming a semiconductor device, comprising the steps: forming a gate electrode 18 having vertically extending sidewalls on a substrate 12; forming first sidewall spacers 54 on the gate electrode 18, each first sidewall spacer 54 having a pair of vertically extending planar sidewalls that are substantially parallel to the gate electrode sidewalls; and performing a source/drain implantation with the gate electrode (col. 7, lines 30-43) and the first sidewall spacers masking the substrate (col. 9, lines 34-50 and figs. 8-18).

Regarding to claim 6, Gardner discloses the method of claim 5, wherein the step of forming first sidewall spacers includes: depositing a spacer layer 54 over the substrate and the gate electrode; forming a protective layer 52 on the spacer layer; and etching the protective layer and the spacer layer to form the first sidewall spacer (fig. 18).

Regarding to claim 7, Gardner discloses the method of claim 6, wherein the step of etching includes dry etching the protective layer to remove the protective layer except for vertically extending portions of the protective layer that are planar and substantially parallel to the gate electrode sidewalls (figs. 13 and 18).

Regarding to claim 8, Gardner discloses the method of claim 7, wherein the step of etching further includes etching the spacer layer to remove the spacer layer from the

substrate and over a top surface of the gate electrode, leaving the spacer layer between the gate electrode sidewalls and the vertically extending portions of the protective Layer (figs. 13 and 18).

Regarding to claim 9, Gardner discloses the method of claim 8, further comprising forming a second sidewall spacer 58 in the first sidewall spacer (fig. 18).

Claim Rejections - 35 U.S.C. § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 10-12 are rejected under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent No. 6,323,519 to Gardner et al. in view of the remark.

Regarding to claims 3 and 12, Gardner discloses the claimed invention except for the method of claim 2, wherein the protective layer is formed to a thickness between about 10 .ANG. to about 100 .ANG..

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the protective layer to a thickness between about 10 .ANG. to about 100 .ANG., since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Regarding to claim 10, Gardner discloses the claimed invention except for the method of claim 8, wherein the spacer layer is etched with an etchant that is highly selective to the spacer layer and does not substantially etch the protective layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the spacer layer that is etched with an etchant that is highly selective to the spacer layer and does not substantially etch the protective layer since it was known in the art that the spacer layer is etched with an etchant that is highly selective to the spacer layer and does not substantially etch the protective layer.

Regarding to claim 11, Gardner discloses the claimed invention except for the method of claim 10, wherein the spacer layer is deposited to a thickness of between about 200 .ANG. to about 1000 .ANG..

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the spacer layer to a thickness between about 200 .ANG. to about 1000 .ANG., since it has been held that where the general conditions of a claim are

disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Conclusion

Any inquiry concerning this communication on earlier communications from the examiner should be directed to Mai-Huong Tran, (571) 272-1796. The examiner can normally be reached on Monday-Thursday from 8:00 AM to 6:30 PM. The examiner's supervisor, David Nelms can be reached on (571) 272-1787.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR, Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Mai-Huong Tran